

**What is Claimed is:**

1. A pulsing apparatus for an electrical system having a nominal voltage and a rated voltage, said pulsing apparatus comprising:
  - first terminals structured to input a first voltage, said first voltage being about said nominal voltage;
  - means for generating a signal from said first voltage, said signal having a duty cycle;
  - means for transforming said first voltage to a second voltage having said duty cycle;
  - second terminals; and
  - means for outputting a current at about said second voltage to said second terminals,
  - wherein said second voltage is greater than said first voltage and less than said rated voltage, said second voltage being adapted to identify an arcing fault in said electrical system, and
  - wherein said duty cycle limits an average value of said current to less than about 6 mA.
2. The pulsing apparatus as recited in Claim 1 wherein said first terminals are structured to input an alternating current voltage as said first voltage.
3. The pulsing apparatus as recited in Claim 2 wherein said alternating current voltage is about 120 VAC<sub>RMS</sub>.
4. The pulsing apparatus as recited in Claim 1 wherein said first terminals include a line terminal and a line neutral terminal; and wherein said second terminals include a load terminal and a load neutral terminal.
5. The pulsing apparatus as recited in Claim 1 wherein said first terminals comprise a line terminal; and wherein said means for transforming comprises a fuse and a transformer having a winding, said fuse being electrically connected between said line terminal and the winding of said transformer.
6. The pulsing apparatus as recited in Claim 1 wherein said means for transforming comprises a transformer including a primary winding for said first voltage and a secondary winding for said second voltage; wherein said means for generating comprises a power supply structured to provide a third voltage from the

first voltage, a duty cycle generator powered from said third voltage and structured to provide a control signal having said duty cycle, and a relay including a coil and a contact, said coil being powered from said third voltage and controlled by said control signal, said contact being controlled by said coil to energize the primary winding with said first voltage at said duty cycle.

7. The pulsing apparatus as recited in Claim 1 wherein said first voltage is an alternating current voltage having a plurality of cycles; and wherein said duty cycle includes an on period and an off period.

8. The pulsing apparatus as recited in Claim 7 wherein said on period includes about one percent of said cycles.

9. The pulsing apparatus as recited in Claim 7 wherein said on period includes about two of said cycles and said off period includes about 178 of said cycles.

10. The pulsing apparatus as recited in Claim 1 wherein said means for transforming comprises a step up transformer including a primary winding having a first plurality of turns and a secondary winding having a second plurality of turns, with a ratio of said second plurality to said first plurality being about four.

11. The pulsing apparatus as recited in Claim 1 wherein said first voltage is about 120 VAC<sub>RMS</sub> and wherein said second voltage is about 480 VAC<sub>RMS</sub>.

12. The pulsing apparatus as recited in Claim 1 wherein said means for outputting comprises a resistor electrically connected in series with a capacitor, with the series combination of said resistor and said capacitor being electrically connected between said means for transforming and one of said second terminals.

13. The pulsing apparatus as recited in Claim 12 wherein said means for outputting further comprises a second resistor electrically connected in parallel with said capacitor.

14. The pulsing apparatus as recited in Claim 1 wherein said second terminals include a first output terminal structured for electrical connection to a load and a second output terminal structured for electrical connection to a neutral.

15. The pulsing apparatus as recited in Claim 1 wherein said second terminals include a first output terminal structured for electrical connection to a load and a second output terminal structured for electrical connection to a ground.

16. A method for identifying an arcing fault in an electrical system having a nominal voltage and a rated voltage, said method comprising the steps of:
- inputting a first voltage, said first voltage being about said nominal voltage;
  - generating a signal from said first voltage, said signal having a duty cycle;
  - transforming said first voltage to a second voltage having said duty cycle, said second voltage being greater than said first voltage and less than said rated voltage, said second voltage being adapted to identify an arcing fault in said electrical system;
  - outputting a current at about said second voltage to said electrical system; and
  - employing said duty cycle to limit an average value of said current to less than about 6 mA.
17. The method as recited in Claim 16 further comprising inputting as said first voltage an alternating current voltage.
18. The method as recited in Claim 16 further comprising inputting as said first voltage about 120 VAC<sub>RMS</sub>; and outputting as said second voltage about 480 VAC<sub>RMS</sub>.
19. The method as recited in Claim 16 further comprising receiving said first voltage at a circuit breaker housing; and outputting said second voltage from said circuit breaker housing.
20. The method as recited in Claim 16 further comprising transforming said first voltage to about 480 VAC<sub>RMS</sub>; and limiting said average value of said current to about 2.8 mA.